CLAIMS

1. A tumor cell which is modified to express a T cell costimulatory molecule, B7-2.

2. The tumor cell of claim 1 which is transfected with a nucleic acid encoding B7-2 in a form suitable for expression of B7-2.

3. The tumor cell of claim 1 which is stimulated to express B7-2.

4. The tumor cell of claim 1 which has B7-2 coupled to the tumor cell.

5. The tumor cell of claim 1 which expresses a T cell costimulatory molecule, B7.

6. The tumor cell of claim 1 which expresses a T cell costimulatory molecule, B7-3.

7. The tumor cell of claim 1 which expresses an MHC class I molecule.

8. The tumor cell of claim 1 which expresses an MHC class II molecule.

9. The tumor cell of claim 1 which normally expresses an MHC class II associated protein, the invariant chain, and wherein expression of the invariant chain is inhibited.

10. A tumor cell which is modified to express a T cell costimulatory molecule, B7-3.

11. The tumor cell of claim 10 which is transfected with a nucleic acid encoding B7-3 in a form suitable for expression of B7-3.

12. The tumor cell of claim 10 which is stimulated to express B7-3.

13. The tumor cell of claim 10 which has B7-3 coupled to the tumor cell.

14. The tumor cell of claim 10 which expresses a T cell costimulatory molecule, B7.

15. The tumor cell of claim 10 which expresses a T cell costimulatory molecule, B7-2.

16. The tumor cell of claim 10 which expresses an MHC class I molecule.

17. The tumor cell of claim 10 which expresses an MHC class II molecule.

18. The tumor cell of claim 10 which normally expresses an MHC class II associated protein, the invariant chain, and wherein expression of the invariant chain is inhibited.

19. A tumor cell transfected with a nucleic acid encoding a T cell costimulatory molecule, B7-2, in a form suitable for expression of B7-2.

20. The tumor cell of claim 19 wherein the nucleic acid is a cDNA in a recombinant expression vector.

21. The tumor cell of claim 19 further transfected with a nucleic acid encoding a T cell costimulatory molecule, B7, in a form suitable for expression of B7.

22. The tumor cell of claim 19 further transfected with a nucleic acid encoding a T cell costimulatory molecule, B7-3, in a form suitable for expression of B7-3.

23. The tumor cell of claim 19 further transfected with at least one nucleic acid comprising DNA encoding:

(a) at least one MHC class II α chain protein; and

(b) at least one MHC class II β chain protein,

wherein the nucleic acid is in a form suitable for expression of the MHC class II α chain protein(s) and the MHC class II β chain protein(s).

24. The tumor cell of claim 23 which does not express MHC class II molecules prior to transfection of the tumor cell.

25. The tumor cell of claim 19 further transfected with at least one nucleic acid encoding at least one MHC class I α chain protein in a form suitable for expression of the MHC class I protein(s).

26. The tumor cell of claim 25 further transfected with a nucleic acid encoding a β-2 microglobulin protein in a form suitable for expression of the β-2 microglobulin protein.

27. The tumor cell of claim 19 which normally expresses an MHC class II associated protein, the invariant chain, and wherein expression of the invariant chain is inhibited.

28. The tumor cell of claim 27 wherein expression of the invariant chain is inhibited by transfection of the tumor cell with a nucleic acid which is antisense to a regulatory or a coding region of the invariant chain gene.

29. The tumor cell of claim 19 which is a sarcoma.

30. The tumor cell of claim 19 which is a lymphoma.

31. The tumor cell of claim 19 which is selected from a group consisting of a melanoma, a neuroblastoma, a leukemia and a carcinoma.

32. A sarcoma cell which is modified to express a T cell costimulatory molecule, B7-2.

33. The sarcoma cell of claim 32 which is transfected with a nucleic acid encoding B7-2 in a form suitable for expression of B7-2.

34. The sarcoma cell of claim 32 which expresses a T cell costimulatory molecule, B7.

35. The sarcoma cell of claim 32 which expresses a T cell costimulatory molecule, B7-3.

36. The sarcoma cell of claim 32 which expresses an MHC class I molecule.

37. The sarcoma cell of claim 32 which expresses an MHC class II molecule.

38. A composition suitable for pharmaceutical administration comprising an amount of the tumor cells of claim 1 and a physiologically acceptable carrier.

39. A composition suitable for pharmaceutical administration comprising an amount of the tumor cells of claim 10 and a physiologically acceptable carrier.

40. A composition suitable for pharmaceutical administration comprising an amount of the tumor cells of claim 19 and a physiologically acceptable carrier.

41. A composition suitable for pharmaceutical administration comprising an amount of the tumor cells of claim 21 and a physiologically acceptable carrier.

42. A method for treating a subject with a tumor, comprising:

(a) obtaining tumor cells from the subject;

(b) modifying the tumor cells to express B7-2, and

(c) administering the tumor cells to the subject.

43. The method of claim 42 wherein tumor cells are modified by transfection with a nucleic acid encoding B7-2 in a form suitable for expression of B7-2 .

44. The method of claim 42 wherein tumor cells are modified by treatment with an agent which stimulates expression of B7-2.

45. The method of claim 42 wherein tumor cells are modified by coupling B7-2 to the tumor cell.

Sub A2

46. A method of treating a subject with a tumor, comprising:

(a) obtaining tumor cells from the subject;

(b) transfecting the tumor cells with a nucleic acid encoding B7-2 in a form suitable for expression of B7-2; and

(c) administering the tumor cells to the subject.

47. The method of claim 46 wherein the tumor cells are further transfected with a nucleic acid encoding B7.

48. The method of claim 46 wherein the tumor cells are further transfected with at least one nucleic acid encoding at least one MHC class II α chain protein and at least one MHC class II β chain protein in a form suitable for expression of the MHC class II α chain protein(s) and the MHC class II β chain protein(s).

49. The method of claim 46 wherein the tumor cells are further transfected with at least one nucleic acid encoding at least one MHC class I α chain protein in a form suitable for expression of the MHC class I protein(s).

50. The method of claim 49 wherein the tumor cells are further transfected with a nucleic acid encoding a β-2 microglobulin protein in a form suitable for expression of the β-2 microglobulin protein.

51. The method of claim 46 wherein expression of an MHC class II associated protein, the invariant chain, is inhibited in the tumor cells.

52. The method of claim 51 wherein expression of the invariant chain is inhibited in the tumor cells by transfection of the tumor cell with a nucleic acid which is antisense to a regulatory or a coding region of the invariant chain gene.

53. The method of claim 46 wherein the tumor is a sarcoma.

54. The method of claim 46 wherein the tumor is a lymphoma.

55. The method of claim 46 wherein the tumor is selected from a group consisting of a melanoma, a neuroblastoma, a leukemia and a carcinoma.

56. The method of claim 46 wherein the tumor cells are administered by intravenous injection.

57. The method of claim 46 wherein the tumor cells are administered by a route selected from a group consisting of intramuscular injection, intraperitoneal injection and subcutaneous injection.

58. A method for preventing or treating metastatic spread of a tumor or preventing or treating recurrence of a tumor in a subject, comprising:

(a) obtaining tumor cells from the subject;

(b) transfecting the tumor cells with a nucleic acid encoding B7-2 in a form suitable for expression of B7-2; and

(c) administering the tumor cells to the subject.

59. The method of claim 58 wherein the tumor cells are further transfected with a nucleic acid encoding B7.

60. A method of inducing an anti-tumor response by CD4+ T lymphocytes in a subject with a tumor, comprising:

(a) obtaining tumor cells from the subject;

(b) transfecting the tumor cells with at least one nucleic acid comprising DNA encoding:

(i) B7-2,

(ii) an MHC class II α chain protein, and

(iii) an MHC class II β chain protein,

wherein the nucleic acid is in a form suitable for expression of B7-2, the MHC class II α chain protein and the MHC class II β chain protein; and

(c) administering the tumor cells to the subject.

Sub B1

61. A method for treating a subject with a tumor comprising modifying ~~tumor cells~~ *in vivo* to express a T cell costimulatory ~~molecule, B7-2~~.

62. The method of claim 61 wherein tumor cells are modified *in vivo* by delivering to the subject *in vivo* a nucleic acid encoding B7-2 in a form suitable for expression of B7-2.

63. The method of claim 61 ~~wherein the nucleic acid is delivered to the subject~~ *in vivo* by injection of the nucleic acid in an appropriate vehicle into the tumor.

64. A method for treating a subject with a tumor, comprising:

(a) obtaining tumor cells and T lymphocytes from the subject;

(b) culturing the T lymphocytes from the subject *in vitro* with the tumor cells from the subject and with a stimulatory form of B7-2; and

(c) administering the T lymphocytes to the subject.

Add A3 add B6 > ADD C3